Commonwealth of Kentucky
Division for Air Quality

PERMIT STATEMENT OF BASIS

FINAL
Conditional Major, Construction / Operating
Permit: F-08-007 R1
Northern KY University
Highland Heights, Kentucky 41099
2 July, 2008
Elizabeth KM Carrier, Reviewer

SOURCE ID:	21-037-00095
AGENCY INTEREST:	37575
ACTIVITY:	APE20080002

SOURCE DESCRIPTION:

Northern Kentucky University is a public university that operates several indirect heat exchangers and emergency generators to meet the heat demands of its campus. NKU is a growing metropolitan university of 14,800 students served by nearly 2,400 faculty and staff. The university is located in the suburb of Highland Heights, KY, seven miles southeast of Cincinnati.

CURRENT PERMIT REVISION, MINOR REVISION F-08-007 R1:

On June 30, 2008, Northern Kentucky University applied for a minor modification to the existing F-08-007 permit. The modification included the addition of two emergency generators. Both are diesel-fired, emergency generators, with rated capacity for the first, emission unit 28, at 400 hp, 1.01 MMBtu/hr, and the second, emission unit 29, at 1300 hp, 3.3 MMBtu/hr. Northern Kentucky University has agreed to an operating limit of no more than 50 hours per year for each generator.

These additions will not significantly increase the source wide potential to emit of any regulated air pollutant. The projected potential emissions increase of regulated air pollutants proposed from the additions is not considered a major modification and meets the requirements of 401 KAR 52:030, Section 14 (conditional major permit-minor revisions). Additionally, this modification will not change the monitoring, record keeping and reporting requirements of the permit. The source shall maintain the source wide federally enforceable operational emissions limits to be less than 90 tons per year for Nitrogen Oxides (NO_x) to preclude the applicability of 401 KAR 52:020.

Emission Units 28 & 29 Two Diesel Fired Emergency Generators
Unit 28 – Maximum Rating: 0.3 MW, 400 HP, Primary Fuel: No.2 Diesel Construction Commenced: 2008

Unit 29 – Maximum Rating: 1.0 MW, 1300 HP, Primary Fuel: No.2 Diesel Construction Commenced: 2008

Each unit is limited to 50 hours of operation per year, based on a consecutive twelve month rolling total.

These units are subject to the applicable requirements of 40 CFR 60 Subpart IIII, because they will be manufactured later than 2007 and are not fire pump engines (§60.4200 (a)(1)(i)).

40 CFR 60 Subpart IIII, Manufacturers of stationary CI ICE with a displacement of less than 30 liters per cylinder where the model year is 2007 or later and are not fire pump engines (§60.4200 (a)(1)(i)).

Pursuant to 40 CFR 60.4209(a), the owner or operator of an emergency stationary CI internal combustion engine, must install a non-resettable hour meter prior to startup of the engine.

Pursuant to 40 CFR 60.4207(a), the owner or operator of stationary CI internal combustion engine that uses diesel fuel must use diesel fuel that meets the requirements of 40 CFR 80.510(a).

Pursuant to 40 CFR 60.4207(b), beginning October 1, 2010, the owner or operator of a stationary CI internal combustion engine that uses diesel fuel must use diesel fuel that meets the requirements of 40 CFR 80.510(b).

Pursuant to 40 CFR 60.4211(a) an owner or operator must comply with the emission standards specified in this subpart, must operate and maintain the stationary CI internal combustion engine and control device according to the manufacturer's written instructions or procedures developed by the owner or operator that are approved by the engine manufacturer. In addition, owners and operators may only change those settings that are permitted by the manufacturer. Permittee must also meet the requirements of 40 CFR parts 89, 94 and/or 1068, as they apply.

Pursuant to 40 CFR 60.4205(b), owner and operators of 2007 model year and later emergency stationary CI internal combustion engines must comply with the emission standards for new nonroad CI engines in 60.4202, for all pollutants, for the same model year and maximum engine power.

Pursuant to 401 KAR 52:030 Section 1(b)(III), the permittee shall monitor the amount of fuel burned and hours of operation for each unit on a monthly basis.

Pursuant to 401 KAR 52:030 Section 1(b)(IV), the permittee shall maintain records of the amount of fuel burned and hours of operation for each unit on a monthly basis.

PAST PERMIT REVISION, RENEWAL F-08-007:

On January 2, 2008, Northern Kentucky University applied to the Division for the renewal permit of their existing permit [F-02-025 R2] for their facility in Highland Heights, Kentucky. The applicant proposes to construct/operate six new natural-gas fired indirect heat exchangers (3 boilers-each 2 MMBtu/hr), (3 boilers-each 1MMBtu/hr) and one 288 hp industrial engine (emergency generator). The indirect heat exchangers will become Emission Units 22, 23, 24, 25, 26 and 27. However, the diesel generator will be placed under Section B emission unit 18, with the same monitoring, record keeping and reporting requirements.

APPLICABLE REGULATIONS AND EMISSION UNITS:

401 KAR 59:015, New Indirect Heat Exchangers applicable to an emission unit with a capacity less than 250 MMBtu/hr and commenced on or after April 9, 1972.

401 KAR 60:005, incorporating by reference 40 CFR 60, Subpart Dc, Standards of performance for small industrial-commercial-institutional steam generating units, for units less than or equal to 100 MMBtu/hr but greater than or equal to 10 MMBtu/hr commenced after June 9, 1989.

401 KAR 61:015, Existing Indirect Heat Exchangers applicable to an emission unit with a capacity less than 250 MMBtu per hour and commenced before April 9, 1972.

40 CFR 60 Subpart IIII, Manufacturers of stationary CI ICE with a displacement of less than 30 liters per cylinder where the model year is 2007 or later and are not fire pump engines (§60.4200 (a)(1)(i)).

Emission Unit 1 Indirect Heat Exchanger
Unit 1 Maximum Continuous Rating: 25.2 MMBtu/hr; Primary fuel: Natural Gas and Secondary fuel: #2 fuel oil Construction Commenced: 2002

Pursuant to 401 KAR 59:015, Section 4(1)(b), particulate emissions shall not exceed 0.1 lb/MMBtu based on a three-hour-average, for the emission unit. Compliance with the allowable particulate emission limitation while burning #2 fuel oil may be demonstrated by calculating emissions rate using the following formula:

PM emissions (lb/ MMBtu) = 2.0 lbs/ 10^3 gallons (AP-42 emission factor) / #2 fuel oil heating value (MMBtu/ 10^3 gallons).

Pursuant to 401 KAR 59:015, Section 4(2), emissions shall not exceed twenty (20) percent opacity based on a six-minute average except:

1. A maximum of forty (40) percent opacity shall be permissible for not more than six (6) consecutive minutes during in any sixty (60) consecutive minutes during cleaning the fire box or blowing soot.

2. During building a new fire for the period required to bring the boiler up to operating conditions provided the method used is that recommended by the manufacturer and the time does not exceed the manufacturer's recommendations.

Pursuant to 401 KAR 59:015, Section 5(1)(b), sulfur dioxide emissions shall not exceed 0.8 lb/MMBtu based on a three-hour-average, for the emission unit. Compliance with the allowable sulfur dioxide emission limitation while burning #2 fuel oil may be demonstrated based on fuel supplier certification.

The unit is considered to be in compliance with the PM, SO_2, and opacity standards while burning natural gas.

Emission Units 2 & 3 Two Indirect Heat Exchangers

Units 2&3 Maximum Continuous Rating: 60.7 MMBtu/hr, each; Primary fuel: Natural Gas and Secondary fuel: #2 fuel oil Construction Commenced: 2002

Pursuant to 401 KAR 59:015, Section 4(1)(b), particulate emissions shall not exceed 0.1 lb/MMBtu based on a three-hour-average, for each emission unit. Compliance with the allowable particulate emission limitation while burning #2 fuel oil may be demonstrated by calculating emissions rate using the following formula:

PM emissions (lb/ MMBtu) = 2.0 lbs/ 10^3 gallons (AP-42 emission factor) / #2 fuel oil heating value (MMBtu/ 10^3 gallons).

Pursuant to 401 KAR 59:015, Section 4(2), and 401 KAR 60:005, incorporating by reference 40 CFR 60, Subpart Dc, visible emissions shall not exceed 20% opacity based on a six minute average, except for one six minute period per hour of not more than 27% opacity.

Pursuant to 401 KAR 59:015, Section 4(2), for visible emissions:

1. A maximum of forty (40) percent opacity shall be permissible for not more than six (6) consecutive minutes during in any sixty (60) consecutive minutes during cleaning the fire box or blowing soot.

2. During building a new fire for the period required to bring the boiler up to operating conditions provided the method used is that recommended by the manufacturer and the time does not exceed the manufacturer's recommendations.

Pursuant to 401 KAR 59:015, Section 5(1)(b), sulfur dioxide emissions shall not exceed 0.8 lb/MMBtu based on a three-hour-average, for each emission unit. Compliance with the allowable sulfur dioxide emission limitation while burning #2 fuel oil may be demonstrated based on fuel supplier certification.

Each unit is considered to be in compliance with the PM, SO_2, and opacity standards while burning natural gas.

Emission Units 4, 5, 6, 7, 10, 11 & 12 Seven Indirect Heat Exchangers
Unit 4 Maximum Continuous Rating: 3.0 MMBtu/hr; Primary fuel: Natural Gas and Secondary fuel: #2 fuel oil Construction Commenced: approximately 1992

Units 5 & 6 Maximum Continuous Rating: 1.8 MMBtu/hr, each Primary fuel: Natural Gas and Secondary fuel: #2 fuel oil Construction Commenced: approximately 1992

Unit 7 Maximum Continuous Rating: 2.45 MMBtu/hr; Primary fuel: Natural Gas and Secondary fuel: #2 fuel oil Construction Commenced: approximately 1996

Unit 10, 11 & 12 Maximum Continuous Rating: 2.0 MMBtu/hr; Primary fuel: Natural Gas and Secondary fuel: #2 fuel oil Construction Commenced: approximately 2003

Pursuant to 401 KAR 59:015, Section 4(1)(b), particulate emissions shall not exceed 0.1 lb/ MMBtu based on a three-hour-average, for each emission unit. Compliance with the allowable particulate emission limitation while burning #2 fuel oil may be demonstrated by calculating emissions rate using the following formula:

PM emissions (lb/ MMBtu) = 2.0 lbs/ 103 gallons (AP-42 emission factor) / #2 fuel oil heating value (MMBtu/ 103 gallons).

Pursuant to 401 KAR 59:015, Section 4(2), emissions shall not exceed twenty (20) percent opacity based on a six-minute average except:

1. A maximum of forty (40) percent opacity shall be permissible for not more than six (6) consecutive minutes during in any sixty (60) consecutive minutes during cleaning the fire box or blowing soot.

2. During building a new fire for the period required to bring the boiler up to operating conditions provided the method used is that recommended by the manufacturer and the time does not exceed the manufacturer's recommendations.

Pursuant to 401 KAR 59:015, Section 5(1)(b), sulfur dioxide emissions shall not exceed 0.8 lb/ MMBtu based on a three-hour-average, for each emission unit. Compliance with the allowable sulfur dioxide emission limitation while burning #2 fuel oil may be demonstrated based on fuel supplier certification.

The permittee is considered to be in compliance with PM, SO_2 and opacity standards while burning natural gas.

Emission Units 8 & 9 Two Indirect Heat Exchangers

Units 8 & 9 Maximum Continuous Rating: 5.33 MMBtu/hr, each; Primary fuel: Natural Gas and Secondary fuel: #2 fuel oil Construction Commenced: Approximately 1971

Pursuant to 401 KAR 61:015, Section 4, particulate emissions shall not exceed 0.55 lb/MMBtu based on a three-hour-average. Compliance with the allowable particulate emission limitation while burning #2 fuel oil may be demonstrated by calculating emissions rate using the following formula:

PM emissions (lb/ MMBtu) = 2.0 lbs/ 103 gallons (AP-42 emission factor) / #2 fuel oil heating value (MMBtu/ 103 gallons).

Pursuant to 401 KAR 61:015, Section 4 (2), emissions shall not exceed 20 percent opacity with respect to particulate matter based on a six-minute average except.

1. A maximum of forty (40) percent opacity shall be permissible for not more than six (6) consecutive minutes during in any sixty (60) consecutive minutes during cleaning the fire box or blowing soot.

2. During building a new fire for the period required to bring the boiler up to operating conditions provided the method used is that recommended by the manufacturer and the time does not exceed the manufacturer's recommendations.

Pursuant to 401 KAR 61:015, Section 5(1), sulfur dioxide emissions shall not exceed 5.95 lb/MMBtu based on a twenty-four-hour average. Compliance with the allowable sulfur dioxide emission limitation while burning #2 fuel oil may be demonstrated based on fuel supplier certification.

The permittee is considered to be in compliance with PM, SO2 and opacity standards while burning natural gas.

Pursuant to 401 KAR 52:030, Section 26, the permittee shall monitor the usage and hours of operation for the fuel burned on a monthly basis.

Pursuant to 401 KAR 52:030, Section 26, while burning #2 fuel oil the permittee shall perform a qualitative visible observation of the opacity emissions from the stack on a weekly basis and maintain a log of the observations. If visible emissions from the stack are seen, then compliance with the opacity standard shall be demonstrated by reading the opacity by EPA Reference Method 9 (condition applicable to units that burn #2 fuel oil).

Emission Units 22- 27 Six Natural Gas Fired Indirect Heat Exchangers
Units 22, 23, & 24 Three AERCO Benchmark Model BMK 3.0 Boilers Maximum Continuous Rating:2.0 MMBtu/hr each

Units 25, 26, & 27 Three AERCO International KC-1000 style 210711 Maximum Continuous Rating:1.0 MMBtu/hr each
Construction Commenced: 2008

Pursuant to 401 KAR 59:015, Section 4(1)(b), particulate emissions shall not exceed 0.1 lb/ MMBtu based on a three-hour-average, for each emission unit.

Pursuant to 401 KAR 59:015, Section 4(2), emissions shall not exceed twenty (20) percent opacity based on a six-minute average except:

1. A maximum of forty (40) percent opacity shall be permissible for not more than six (6) consecutive minutes during in any sixty (60) consecutive minutes during cleaning the fire box or blowing soot.

2. During building a new fire for the period required to bring the boiler up to operating conditions provided the method used is that recommended by the manufacturer and the time does not exceed the manufacturer's recommendations.

Pursuant to 401 KAR 59:015, Section 5(1)(b), sulfur dioxide emissions shall not exceed 0.8 lb/ MMBtu based on a three-hour-average for each emission unit.

Each unit is considered to be in compliance with the PM, SO_2, and opacity standards while burning natural gas.

Pursuant to 401 KAR 52:030, Section 26, the permittee shall monitor the usage and hours of operation for the fuel burned on a monthly basis.

The following units (**EU 18 toEU21**) **do not** have any applicable regulations due to size, and date of construction:

Emission Unit 18--- Twelve Diesel Fired Emergency Generators Ranging between 27.0 & 400 HP
Maximum Continuous Rating: 27 to 400 HP Primary Fuel: No.2 Diesel Construction Commenced: twelve prior to 2004
Controls: None

Emission Units 19, 20, & 21 Three Diesel Fired Emergency Generators
Unit 19 – Maximum Rating: 750 KW, (1000 HP) Primary Fuel: No.2 Diesel Construction Commenced: 1995

Unit 20 – Maximum Rating: 800 KW, (11180 HP) Primary Fuel: No.2 Diesel Construction Commenced: 2000

Unit 21 – Maximum Rating: 85 KW, (760 HP) Primary Fuel: No.2 Diesel Construction Commenced: 1995

Each unit is limited to 50 hours of operation per year, based on a consecutive twelve month rolling total.

These units are not subject to the applicable requirements of 40 CFR 60 Subpart IIII, because they were manufactured prior to April 1, 2006 and are considered emergency generators (§60.4200 (a)(2)(i)). These units are an emission unit for clarity because their emissions affect the source-wide limit on SO_2. Any future diesel generators that are added to the facility will be subject to 40 CFR 60 Subpart IIII.

Pursuant to 401 KAR 52:030, Section 26, the permittee shall monitor the usage and hours of operation for the fuel burned on a monthly basis.

Facility Location and Attainment Status:
This facility is located in Campbell County, Kentucky. Since this facility's classification as conditional major/non-Title V with emissions of NOx below 90 tons per year has not changed, therefore no further emissions limitations would be triggered.

EMISSION AND OPERATING CAPS DESCRIPTION:
The source has the potential to be a major source for Nitrogen Oxides (NOx) emissions. However, the source has been classified as a conditional major source with a federally enforceable limit not to equal or exceed 90 tons per year for Nitrogen Oxides (NOx) to preclude the applicability of 401 KAR 52:020. The source is limiting the indirect heat exchangers to 5840 hours per year of operation.

CREDIBLE EVIDENCE:
This permit contains provisions which require that specific test methods, monitoring or recordkeeping be used as a demonstration of compliance with permit limits. On February 24, 1997, the U.S. EPA promulgated revisions to the following federal regulations: 40 CFR Part 51, Sec. 51.212; 40 CFR Part 52, Sec. 52.12; 40 CFR Part 52, Sec. 52.30; 40 CFR Part 60, Sec. 60.11 and 40 CFR Part 61, Sec. 61.12, that allow the use of credible evidence to establish compliance with applicable requirements. At the issuance of this permit, Kentucky has only adopted the provisions of 40 CFR Part 60, Sec. 60.11 and 40 CFR Part 61, Sec. 61.12 into its air quality regulations.